



Practitioner's Docket No. C7547 US

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Howard Anthony Barnes, et al.

Application No.: 09/824,354

Filed: 04/02/2001

Group No.: 3752

Examiner: C. S. Kim

For: METHOD AND APARATUS FOR  
GENERATING WATER SPRAYS, AND  
METHODS OF CLEANING USING WATER SPRAYS

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BRIEF ON APPEAL

**Real Party In Interest:** The real party interest is JohnsonDiversey, Inc, the present assignee of this application.

**Related Appeals and Interferences:** None

**Status of Claims:** Claims 1 through 18 are pending in the application. Claims 1-12 and 18 are rejected under 35 USC 103(a) and are appealed. Claims 13-17 are withdrawn from further consideration under 37 CFR 1.142(b) as being directed to a nonelected invention.

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**Status of Amendments:** No Amendments after Final Rejection were submitted in this application.

**Summary of Invention:**

The present invention relates to a method of generating a water spray using water and an adjacent air stream to form large droplets of from 0.5 to 2mm which thereby have a momentum suitable for cleaning of hard surfaces on impact. The use of the spray of the present invention provides droplets with an effective momentum for a given water stream velocity and provide effective cleaning without having to increase water pressure (velocity). The water droplets are formed by ejecting water under pressure from a nozzle opening to form a water stream and providing a gas flow adjacent the ejected water stream. The air stream aids in the formation of water droplets of an effective size, helps maintain the velocity of the droplets and reduces the tendency of the ambient air to atomize the droplets, as is the case when a high pressure water stream emerges from a nozzle into still air. A preferred apparatus for practicing the method is disclosed in the specification and drawings.

1. A method of generating a water spray comprising ejecting water under pressure from a nozzle opening to form a water stream and providing a gas flow alongside the ejected water stream traveling in generally the same direction,	Page 3, Ll 20 – 23
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<p>the relative velocities of the water stream and the gas flow being such that, at a distance of 1m from the nozzle opening the volume median diameter of the water droplets is in the range of 0.5 to 2mm.</p>	<p>Page 3, Ll 23 - 27</p>
<p>2. A method according to claim 1 wherein the ratio of the velocity of the gas flow to the velocity of the water stream immediately downstream of the nozzle opening is in the range of 0.5 to 2.</p>	<p>Page 4, Ll 1 - 3</p>
<p>3. A method of generating a water spray comprising ejecting water under pressure from a nozzle opening to form a water stream and providing a gas flow alongside the ejected water stream traveling in generally the same direction, the ratio of the velocity of the gas flow to the velocity of the water stream immediately downstream of the nozzle opening being in the range 0.5 to 2.</p>	<p>Page 3, Ll 20 - 23</p> <p>Page 4, Ll 1 - 3</p>
<p>4. A method according to claim 3</p>	<p>Page 5, Ll 7 - 9</p>

wherein said velocity ratio is in the range of 0.75 to 1.5.	
5. A method according to claim 1 wherein the volume median diameter of the water droplets at 1m from the nozzle opening is in the range 0.5 to 1.5 mm.	Page 5, Ll 23 - 24
6. A method according to claim 1 wherein the average water droplet velocity at the centre of the spray at 1m from the nozzle opening is not more than 35m/s.	Page 5, Ll 26 - 27
7. A method according to claim 1 wherein the average water droplet velocity at the centre of the spray at 1m from the nozzle opening is not less than 15m/s.	Page 5, Ll 28 - 29
8. A method according to claim 1 wherein the water flow rate is in the range 14 to 28 l/min.	Page 6, Ll 2 - 3
9. A method according to claim 1 wherein the volumetric ratio of the gas flow to the water stream is at least 100.	Page 5, Ll 11 - 12

10. A method according to claim 1 wherein the volumetric ratio of the gas flow to the water stream is not more than 600.	Page 5, Ll 17 - 19
11. A method according to claim 1 wherein the gas flow is an air flow.	Page 4, Ll 9 – 12 Page 6, Ll 6 - 7
12. A method of cleaning a hard surface comprising directing at the surface a water spray generated by a method according to claim 1.	Page 3, Ll 10 – 12 Page 8, Ll 8 - 10
18. A method according to claim 1 wherein the gas flow substantially surrounds the ejected water stream at a point downstream from the nozzle opening.	Page 4, Ll 10 – 11 Page 11, Ll 7 - 10

**Issues:**

1) Whether claims 1-12 and 18 are unpatentable under 35 USC 103(a) over Utter et al (6,126,961) entitled “Fan Propelled Mister” (hereafter “’961”).

2) Whether a reference which teaches the method of evaporative cooling of human faces with a fine mist of water accompanied by an air stream teaches or suggests a method of generating a water spray comprising large water droplets in the range of 0.5 to

2mm entrained in an air stream to provide added momentum so the water stream is particularly effective for impacting and cleaning hard surfaces.

**Grouping of Claims:**

For purposes of the rejection of claims 1- 12 and 18 under 35 USC 103(a) the claims do not stand or fall together. Appellants believe the claims should be grouped as follows for purposes of this Appeal:

Group I. Claims 1-11 and 18 directed to a method of generating a water spray.

Group II. Claim 12 directed to a method of cleaning hard surfaces utilizing the water spray of claim 1.

Claim 12 is believed separately patentable over the remaining claims because prior art which discloses generating water sprays for purposes other than cleaning would not teach or recognize the unique requirements of sprays for cleaning a hard surface. In

Appellants' paper no 13 mailed June 5, 2003 at page 2, second full paragraph, Appellants offered to amend claims 1 and 3 to be directed to a "cleaning spray" in order to further distinguish over the reference if needed and expedite prosecution. The Examiner did not comment on Appellants offer and the amendment is considered unnecessary.

**Argument:**

**THE REJECTION UNDER 35 USC 103(a)**

**Claims 1 - 12 and 18 stand rejected under 35 USC 103(a) as being unpatentable over Utter et al (6,126,961).**

The present invention is directed to a method of generating a water spray by entraining the spray from a nozzle in an air stream such that the diameter of the water droplets 1m from the nozzle opening is from 0.5 to 2 mm. These rather large water droplets can be propelled a significant distance and are particularly suitable for cleaning purposes due to their rather large size and considerable momentum resulting from the droplet size and velocity. Thus, the use of a high pressure (velocity) water stream which had been previously thought necessary to enhance cleaning power can be avoided. The use of the gas stream not only entrains the water droplets and propels them towards the surface being cleaned, but also controls the formation of the droplets and reduces the tendency of the surrounding air to atomize the droplets, as is the case when a high pressure water stream emerges from a nozzle into the ambient air. The cleaning stream can be effective at various ranges such as 1 to 4 meters from the spray nozzle.

In contrast to the present invention, the '961 patent is directed toward cooling the face of a human being with a very fine mist of water accompanied by an air stream to enhance the cooling effect. This reference does not address the objective of propelling large drops of water at sufficient velocities for cleaning purposes or of providing effective cleaning without increasing the pressure of the water source. The water drops of the present invention as set forth in claim 1 are in the range of 0.5mm to 2mm which is from 2 or 3 times to as much as 100 times the size of mist droplets as used in '961.

Moreover, '961 teaches away from using large drops of water having high momentum as desired in the present invention because the mist in the '961 patent is intended to be directed at the faces of people at close range and the cleaning stream of the present invention would clearly not be suitable for such purpose.

The Examiner states that it would have been obvious to one of ordinary skill in the art to have used conventional nozzles with various fan speeds in the device of '961 for desired spray parameters and characteristics dependent on application. Appellants disagree that '961 would have rendered the present invention obvious to one skilled in the art. The '961 patent is directed to evaporative cooling suitable for cooling a human face. One skilled in that art armed with the teachings of '961 would only be led to use atomizing spray heads (col. 4, lines 6 and 7) that provide a finely divided, atomized water vapor mist for the intended purpose. There would be no reason to use other types of spray heads that would emit larger droplets which are less effective for cooling and could at the very least cause "discomfort" if impacting a human face. This would render the '961 device ineffective for its intended purpose of cooling people. The only suggestion of using large water drops propelled by a parallel gas flow to achieve enhanced cleaning is found in the present application. It is fundamental to 35 USC 103 that the Examiner cannot use applicants' own disclosure to show obviousness. If the Examiner has independent knowledge that is being relied on to reject the claims, the Examiner is required to present such knowledge in the form of an affidavit as required by 37 CFR 1.104(d)(2) so that Appellants can be apprised of the basis for the rejection and can fairly judge the propriety of proceeding with the prosecution of the application.



**Separate patentability of the claims:**

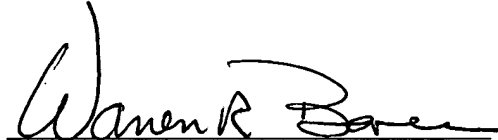
Appellants have alleged claim 12 is separately patentable. Claim 12 is expressly directed to a method of cleaning hard surfaces. Clearly the '961 patent is not directed to this art area and teaches nothing about cleaning surfaces using water or the size of the droplets effective to provide such cleaning. Even in the unlikely event one could conclude that Utter et al taught the use of such streams for cooling a human face, that would not suggest the use of such streams for cleaning purposes. Cooling and cleaning involve different chemical and physical phenomenon and one would not suggest the other. In Appellants' paper no 13 mailed June 5, 2003 at page 2, second full paragraph, Appellants offered to amend claims 1 and 3 to be directed to a "cleaning spray" in order to further distinguish over the reference if needed and expedite prosecution. The Examiner did not comment on Appellants offer and the amendment is considered unnecessary.

**Conclusion:**

It is believed that the claims are patentable over the reference. Reversal of the Examiner's rejection by the Board is respectfully requested.

Respectfully Submitted

Date: October 7, 2003

A handwritten signature in cursive script, reading "Warren R. Bovee", written over a horizontal line.

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**Appendix:**

**The Claims On Appeal**

1. A method of generating a water spray comprising ejecting water under pressure from a nozzle opening to form a water stream and providing a gas flow alongside the ejected water stream traveling in generally the same direction, the relative velocities of the water stream and the gas flow being such that, at a distance of 1m from the nozzle opening the volume median diameter of the water droplets is in the range of 0.5 to 2mm.
2. A method according to claim 1 wherein the ratio of the velocity of the gas flow to the velocity of the water stream immediately downstream of the nozzle opening is in the range of 0.5 to 2.
3. A method of generating a water spray comprising ejecting water under pressure from a nozzle opening to form a water stream and providing a gas flow alongside the ejected water stream traveling in generally the same direction, the ratio of the velocity of the gas flow to the velocity of the water stream immediately downstream of the nozzle opening being in the range 0.5 to 2.
4. A method according to claim 3 wherein said velocity ratio is in the range of 0.75 to 1.5.

5. A method according to claim 1 wherein the volume median diameter of the water droplets at 1m from the nozzle opening is in the range 0.5 to 1.5 mm.
6. A method according to claim 1 wherein the average water droplet velocity at the centre of the spray at 1m from the nozzle opening is not more than 35m/s.
7. A method according to claim 1 wherein the average water droplet velocity at the centre of the spray at 1m from the nozzle opening is not less than 15m/s.
8. A method according to claim 1 wherein the water flow rate is in the range 14 to 28 l/min.
9. A method according to claim 1 wherein the volumetric ratio of the gas flow to the water stream is at least 100.
10. A method according to claim 1 wherein the volumetric ratio of the gas flow to the water stream is not more than 600.
11. A method according to claim 1 wherein the gas flow is an air flow.
12. A method of cleaning a hard surface comprising directing at the surface a water spray generated by a method according to claim 1.

18. A method according to claim 1 wherein the gas flow substantially surrounds the ejected water stream at a point downstream from the nozzle opening.